REMARKS/ARGUMENTS

Claims 1-20 and 34-37 are pending. The rejections in the September 3, 2008 Office Action have been fully addressed in the Amendment filed December 3, 2008 and the Supplemental Amendment filed February 3, 2009. This Supplemental Amendment is submitted to memorialize and clarify additional issues discussed at the personal interview conducted on December 22, 2008. An interview summary as suggested by M.P.E.P. §713.04 was provided in the February 3 Supplemental Amendment. Deficiencies of the cited art other than those presented herein have been previously presented, and are not repeated here for clarity and brevity. Thus, the absence of a prior argument from the present Amendment is not intended to signify acquiescence to any argument or interpretation put forth in any prior Office Action.

By this Amendment, claims 1 and 11 are amended and claims 38-39 are new. Amendments to the claims are shown relative to the claims as submitted with the February 3, 2009 Supplemental Amendment. No new matter has been added.

Shtein and Shtein II Do Not Describe A Real OVJP System or Method.

During the interview, the Examiner acknowledged that OVPD and OVJP are recognized as separate and different methods in the art, but argued that Shtein's section VII describes how to perform an OVJP process based on the OVPD process described in the previous sections. However, as discussed during the interview, Shtein merely describes mathematical simulations that were used to investigate whether it would be possible to replace the diffusive transport regime of OVPD with a relatively high-velocity carrier gas jet. The simulations do not describe a real OVJP system, and the assumptions made in constructing them do not consider dynamic pressure.

Shtein describes two simulations that were performed to investigate the use of a high-velocity carrier jet. The simulations are specifically described as using particular assumptions to model a jet of organic vapor:

> The foregoing results have modeled the jet deposition process using two extreme assumptions – one modeled only individual collisions of the organic molecules with the carrier gas, while the other ignored the molecular nature of the flow altogether.

Page 4015, lines 47-51. A jet of organic material in a carrier gas as modeled in Shtein includes two primary components – the carrier gas and the organic molecules. Each of the simulations described in Shtein includes only one of these components in its calculations.

The first simulation uses Monte Carlo methods to model a flow of particles at a high velocity in the direction of the substrate (*z*):

> In the Monte Carlo simulation, the *z*-directed carrier gas velocity u_z can be increased to simulate a jet that broadens **only by the isotropic random molecular velocities** superimposed onto this flow field. Figure 16(a) shows the spatial concentration profile for a simulated jet of N_2 carrying Alq_3, with **mfp**=10 μm, ***t***=50 μm, and $\boldsymbol{u_z}$=100 m/s, while the mean thermal speed *u*=500 m/s. Since the flow field was not known in this regime, **the simulation assumes $du_z/dz=0$** for simplicity. The figure shows that the collimated jet can result in a deposit with well-defined edges even for s>>mfp. The flow field used for this simulation, however, is only approximate, **neglecting the influence of the substrate in close proximity to the nozzle.**

Id., lines 24-37 (emphasis added). The Monte Carlo simulation models "only individual collisions of the organic molecules with the carrier gas," (lines 48-50) and ignores any effects that may result from the flow of the carrier gas itself. Notably, the Monte Carlo simulation does not allow for any pressure difference between the nozzle and the substrate, since the velocity of the modeled particles is held constant. (*See* lines 31-32, stating that "the simulation assumes $du_z/dz=0$," which indicates a constant velocity; *see also* Fig. 16(a) caption, stating that the "*z* directed velocity component u_z=100 m/s [was] held constant along *z*"). This causes the simulation to **omit** any consideration of a possible pressure differential in the region between the nozzle and the substrate relative to the ambient pressure. At least because of this omission, the simulation does not – and, in fact cannot – include any pressure effects, including the **dynamic pressure** recited in independent claim 1.

The second simulation described in Shtein is application of the Navier-Stokes equations used to model OVPD to approximate flow from a nozzle. *See* p. 4015, lines 39-46. As described, the Navier-Stokes model "ignore[s] the molecular nature of the flow altogether." *Id.*, lines 50-51 and 37-46. The effects of this omission can be seen by comparing the Navier-Stokes results (Shtein's Fig. 16(b)) with the more accurate deposition profile data described with respect

to Figure 5 in the present application. Notably, the flow field resulting from the Navier-Stokes simulation is different from the flows that result in the OVJP process described in the present application. Further, as stated in the present application, the OVJP data show that "the profile of the deposited material is favorably affected by a dynamic pressure of at least 1 Torr." ¶ 0055. This dynamic pressure is simply not included in the Navier-Stokes-based simulation and, therefore, the deposition profiles shown in Shtein's Fig. 16(b) do not describe an OVJP system.

In fact, both of the theoretical systems defined by Shtein's simulations are non-physical systems. That is, since they do not account for (1) the collisions of the organic molecules with the carrier gas, (2) the fluid-like flow of the gas, and (3) pressure differentials that can occur between the nozzle and the substrate in OVJP, they are not an accurate model of a real OVJP system. Thus, a real, physical system **cannot** be created that has the mathematical properties used in the simulation. As discussed during the interview, one of skill in the art could not use the simulations described in Shtein as a roadmap to adapt an OVPD system to perform the claimed methods.

Shtein II is simply a presentation of the simulations and results described in Shtein I, and provides no further indication of how to build or use an OVJP system. Notably, Shtein II also fails to disclose or suggest the use of a dynamic pressure as recited in claim 1.

<u>The Cited Art Does Not Enable All the Features Recited in the Claims.</u>

For a reference to anticipate a claim, the reference must provide an enabling reference of the desired subject matter. M.P.E.P. §2121, 2121.01. As described above, the simulations relating to OVJP described in Shtein and referenced in Shtein II make assumptions that eliminate any consideration of a "dynamic pressure" as recited in claim 1. Thus, the references do not enable one of skill in the art to produce the claimed dynamic pressure without undue experimentation, and are non-enabling at least with respect to this feature. For at least this reason, Shtein and Shtein II fail to anticipate claim 1 and all claims dependent therefrom.

<u>Claim Amendments</u>

Claims 1 and 11 are amended and claims 38-39 are new. These amendments and new claims are submitted to remove a claim feature from the independent claims and present it in

dependent claim, *i.e.*, claims 38 and 39 are equivalent to claims 1 and 11 as previously presented. Applicants also note that this claim feature was added in a prior amendment and claims without this feature have been previously searched. Therefore, it is believed that the amendments presented herein should require only a minimal additional search, if any, relative to the prior claims. Applicants also note that this Amendment is filed subsequent to a Request for Continued Examination, but prior to an action on the merits by the Office. Entry of the amendments is respectfully requested

As noted, the claims are amended to remove the feature "at least one of the nozzle diameter, the nozzle length, and nozzle-to-substrate separation is about equal to the gas mean free path length" to dependent claims. This feature was added in a prior Amendment. In view of subsequent prosecution, it is respectfully submitted that the feature is not necessary to distinguish over any art of record. Specifically, as discussed during the interview, Applicants believe that at least the feature(s) of forming a plurality of separate films of the organic material on the substrate, and/or of a dynamic pressure of at least 1 Torr greater than the background pressure define over the relevant art of record and, for at least this reason and the reasons previously presented, all the pending claims are in condition for allowance.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a further telephone conference or personal interview would expedite prosecution of this application, please telephone the undersigned at 202-481-9926.

The Commissioner is authorized to charge any fees due or credit any overpayment to the deposit account of Townsend and Townsend and Crew LLP, Deposit Account No. 20-1430.

Respectfully submitted,

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